

## Depression as an Evolutionary Adaptation

Rafael Euba

Consultant Psychiatrist, Oxleas NHS Foundation Trust, Memorial Hospital, Shooters Hill, London

Rafael.Euba@nhs.net

*\*Corresponding Author: Rafael Euba, Consultant Psychiatrist, Oxleas NHS Foundation Trust, Memorial Hospital, Shooters Hill, London.*

### Abstract

*There have been numerous attempts to understand depression within an evolutionary context. From a philosophical point of view, evolutionary approaches to illness appear to start from an assumption that all natural processes must have a positive purpose. However, depression poses an enormous cost to the individual, both in terms of survival and reproduction, the two main goals of natural selection.*

### INTRODUCTION

It has been suggested that depression plays an evolutionary adaptive role by forcing the sufferer to disengage from unobtainable or futile goals. Depression encourages the avoidance of conflict with more powerful competitors and in this way it helps save valuable energy [1]. A weak but not depressed individual might confront a stronger opponent and perhaps even die in the process. Depression may also promote “sickness behaviour”, which will help a vulnerable person conserve energy through social avoidance [2]. Depression can be, it has been argued, a way to “signal” the need to obtain care or to re-negotiate an unsatisfactory social arrangement [1,3]. Finally, depressive ruminations have, according to some evolutionary thinkers, a problem solving function in situations of adversity [4].

### INFALLIBLE NATURE

There have been numerous attempts to understand mental illness from an evolutionary point of view [5, 6]. The common factor in some of these approaches has been a belief that mental disorders, such as depression and paranoia, are associated with hidden adaptations that will prove advantageous in a hostile environment, either to the individual or otherwise to the wider group, although to be precise, evolutionary authors often make a distinction between proximate and ultimate mechanisms that link an initial response to adversity with the eventual illness [7,8].

From a philosophical point of view, evolutionary approaches to illness appear to start from an assumption that Nature must, by definition, be right and that all natural processes must have a positive purpose, including suffering of any kind, even if this is not immediately obvious. This subliminal idea is reminiscent of the “skeptical theism” approach to the “problem of evil” in religion [9], which also assumes that suffering must have a hidden but ultimately positive function.

### SOCIAL WITHDRAWAL AND SOCIAL GAINS

Seeing depression as a way to negotiate the acquisition of social gains (such as attention to their unmet needs, or a shift in their social roles) through a costly signalling of pain ignores the fact that sufferers of depression tend to experience heavy social losses as a result of their symptoms, both in terms of their occupational lives and in their personal relationships. The hypothesis that depressive ruminations can have a problem-solving function is equally difficult to accept. Depressive ruminations are typically counterproductive. In fact, the cognitive challenging of these ruminations through a therapeutic process often results in a clinical improvement of the depression.

### PERSONALITY

Natural selection has produced a human genome that contains in it the blueprints for a range of personality types. This range of personalities, from the timid to the expansive and the suspicious, when living together in a group, are well adjusted for survival, as each one of

## Depression as an Evolutionary Adaptation

---

them is well adapted to fulfil a certain social function. Undoubtedly, certain personality types that may be more prone to depression, such as the introverted and the avoidant, include character traits that would be associated with a certain type of survival strategy, but it is important to remember that a personality trait is not a mental illness. This may seem a relatively subtle distinction in this context, but it is also a crucial one, as otherwise we might risk trivialising mental illness, by suggesting that it is nothing but an unfortunate expression of a certain survival strategy and therefore a good thing after all, at least from that point of view [4]. We would then fail to acknowledge the awful impact that mental illness has on the individual.

### FAULTY OUTCOMES

In fact, disease in the mind occurs for the same reasons as in the body, because the immensely complex process of conception, gestation, growth and development, interactions with the environment and ageing, occasionally produces a faulty outcome. Natural selection tends to filter out those characteristics that obstruct or hinder survival and procreation, but only if they manifest themselves in reproductive age. The aetiology of mental illness, in any case, is almost universally recognised as being multi-factorial.

We know that depression and psychosis are associated with significantly poorer physical health and a higher risk of a premature death [10]. In fact, death by suicide, a fatal complication in depression, is at the moment the main cause of death among young people aged 20 to 34 years in the UK, according to recent statistics [11]. Depression also lowers libido, a particularly powerful barrier to a successful reproduction. It is therefore very hard to see how such devastating illnesses, which affect both survival and reproduction, could have possibly been positively encouraged by an evolutionary process.

It can be argued, of course, that mental illness does exist and this in itself proves that it must have a role in survival and reproduction. Otherwise natural selection would have filtered them out. But natural selection has not filtered out many other medical disorders either, such as ischaemic heart disease or Huntington's, perhaps because they manifest themselves after the individual has already lived long enough to reproduce. A mental illness is, if anything, an obstacle to survival and reproduction, and a threat to the survival of the progeny, but it needs a combination of factors to reveal itself, beyond the purely genetic.

Clinicians will find those evolutionary approaches that explicitly accept that depression is pathological, while still believing that there are evolutionary factors in its pathogenesis, more acceptable. These approaches may, for instance, understand depression as a dysregulated adaptation to stress and adversity [5], or as a simple expression of psychological pain [1, 3], although the latter confusingly creates a nosological problem when it regards the psychological pain as a mere factor in the genesis of the depression, rather than as the core of the depression itself.

### DIMENSIONAL APPROACH

By adopting a dimensional approach, which acknowledges the already mentioned distinction between proximate and ultimate mechanisms linking an initial response to adversity with the eventual illness, it soon becomes clear that some disorders are more closely related to natural selection than others. Immunity against infections offers an obvious major advantage in terms of survival and yet an autoimmune disorder is only one dysregulated step away from that benefit. Dementia, on the other hand, is unrelated to natural selection in practical terms, as it is in essence an involuntal disorder that occurs after reproductive age. In this dimension, it is possible to postulate a connection between major functional psychiatric disorders like depression and psychosis and natural selection mechanisms, but these disorders are certainly not the direct result of such adaptations.

It seems more helpful to think of the immediate responses to distress, risk and adversity as being mediated through adaptive mechanisms, in contrast with depression itself, which is conceptually distant from such mechanisms and much more complex. Understanding functional psychiatric disorders as mere dysregulations of advantageous natural responses is unhelpful.

Ultimately, every illness can be potentially conceptualised in terms of evolution, as the primordial components of all biological phenomena are subjected to natural selection, but doing so will not always be very useful.

### CONCLUSION

It seems reasonable to conclude that depression, as well as ischaemic heart disease and Huntington's, all exist despite natural selection and not because of it, while acknowledging that its primordial components

## Depression as an Evolutionary Adaptation

(i.e. social withdrawal as a response to adversity) were favoured through evolutionary mechanisms. Depression itself cannot have been promoted by natural selection, as it in fact threatens survival and reproduction, but neither has it been eliminated by evolution, simply because illnesses of any type are -essentially and primarily- faulty outcomes in the multi-factorial and very complex processes of life.

### REFERENCES

- [1] Watson PJ, Andrews PW. (2002). Toward a revised evolutionary adaptationist analysis of depression: the social navigation hypothesis. *Journal of Affective Disorders*; 72:1-14.
- [2] Raison CL., Miller AH. (2017). Pathogen-host defense in the evolution of depression: insights into epidemiology, genetics, bioregional differences and female preponderance. *Neuropsychopharmacology*; 42:5-27.
- [3] Hagen EH. (2003). The Bargaining Model of Depression. In Hammerstein P. (Ed.) *Genetic and Cultural Evolution of Cooperation* (pp. 95-124). The MIT Press.
- [4] Andrews PW, Thompson JA. (2009). The bright side of being blue: depression as an adaptation for analyzing complex problems. *Psychological Review*; 116:620-654.
- [5] Nesse RM. (2000). Is Depression an Adaptation? *Archives of General Psychiatry*; 57:14-20.
- [6] Burns J. (2004). An Evolutionary Theory of Schizophrenia: Cortical Connectivity, Meta representation and the Social Brain. *Behavioral and Brain Sciences*; 27:831-855.
- [7] Rantala, M.J., Luoto, S., Krams, I., Karlsson, H., Depression subtyping based on evolutionary psychiatry: proximate mechanisms and ultimate functions, *Brain, Behavior, and Immunity* (2017), doi: <https://doi.org/10.1016/j.bbi.2017.10.012>
- [8] Nesse, R. M., & Dawkins, R. (2010). Evolution: Medicine's most basic science. In D. A. Warrell, T. M. Cox, J. D. Firth & E. J. J. Benz (Eds.), *Oxford Textbook of Medicine*, 5th edition (pp. 12-15). Oxford: Oxford University Press.
- [9] Wilks I. (2014). The global skepticism objection to skeptical theism. In McBrayer JP and Howard-Snyder D (Eds.) *The Blackwell Companion to The Problem of Evil* (pp. 458-467). Wiley-Blackwell.
- [10] Gilman SE., Sucha E., Kingsbury M. et al. (2017). Depression and mortality in a population-based longitudinal study: 1952 to 2011. *CMAJ*; 189:1304-1310.
- [11] Mental Health Foundation (2017). Suicide. Retrieved from <https://www.mentalhealth.org.uk/a-to-z/s/suicide>

**Citation:** Rafael Euba. *Depression as an Evolutionary Adaptation. Archives of Neurology and Neuro Disorders. 2018; 1(1): 27-29.*

**Copyright:** © 2018 Rafael Euba. *This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.*